

Cyclotron Waves Associated With the Pick-Up of Interstellar Ions: Recent Ulysses Results

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Ulysses observations both in and out of the ecliptic reveal the presence in the solar wind of ions, principally of hydrogen, created by the ionization of interstellar neutrals. We have previously reported the observation of hydromagnetic waves with frequencies at and above the local cyclotron frequency whose spectrum agrees reasonably well with theoretical predictions based on the instability that results from these pick-up ions. The waves are typically weak and appear to occur intermittently, being seen when they exceed a threshold set by the ever-present magnetic fluctuations and turbulence. Nevertheless, they have continued to be observed throughout the mission (including intervals well after Jupiter encounter so that they cannot be associated with that planet). We have expended considerable effort in identifying these waves and in ensuring that they are not contaminated by spacecraft-associated interference. These techniques and safeguards will be discussed and the wave properties, including rate of occurrence, and signal strength, will be presented.

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